

# NAVAL MEDICAL RESEARCH AND DEVELOPMENT NEWS

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## Naval Health Research Center's Tactical Medical Logistics Planning Tool

By NHRC Public Affairs

Military medical personnel stand up a forward resuscitative surgical system (FRSS) in the field to provide emergency surgical interventions to stabilize warfighters before treatment. Because it is forward located, casualties will get to the FRSS fast.

A fully functioning medical treatment facility will be available to provide life-saving care and transportation will be available to move casualties in and out. This specific facility, its location, and associated assets were carefully planned through virtual means, without risking lives and for far less cost than conducting live exercises or wargames.

Medical planners used modeling and simulation tools to determine the minimum capabilities necessary to maximize medical outcomes and ensure the success of the FRSS and the entire expeditionary medical mission.

The Naval Health Research Center ([NHRC](#)) in San Diego devel-

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Electrician's Mate 2nd Class Allen Hodges, assigned to Maritime Civil Affairs and Security Training (MCAST) Command, communicates a nine-line medical evacuation request during a tactical combat casualty care field training exercise at Dam Neck Annex. The training prepares non-medical personnel to perform life-saving techniques under the harsh pressure of battlefield environments. Photo by Mass Communication Specialist 2nd Class Matt Daniels.

## Dengue Fever Rears Its Ugly Head in Hawaii

By NAMRU-2 Public Affairs

The U.S. Naval Medical Research Unit No. 2 ([NAMRU-2](#)) Pacific and Navy Environmental and Preventive Medicine Unit No. 6 (NEPMU-6) teamed up to assist the State of Hawaii with an outbreak of dengue fever that hit the islands.

In early February of this year, the state of Hawaii Department of Health confirmed four cases of dengue fever on the island of Oahu. These initial cases were reported to have no history of travel to a dengue endemic area and were localized to a single neighborhood in Pearl City, a short

distance from the U.S. Marine Corps Manama housing area. Since February, NAMRU-2 Pacific and NEPMU-6 have been assisting with the outbreak by providing informational pamphlets to the residents of the Manama housing area, educating the public on ways to control mosquitoes around their homes, and conducting mosquito trapping and dengue testing.

Of the almost 100 suspected cases of dengue fever, 42 have tested negative with the rest awaiting testing, which is being done by the joint NAMRU-2/NEPMU-6 lab, the Hawaii State Labs and the Centers for

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## Commanding Officer's Message

In May, Naval aviation's centennial marked 100 years of accomplishment, innovation and teamwork. Naval airpower has become one of the finest fighting forces in the world and is relied upon to deliver credible capability from the sea, anytime, anywhere in the world. Today, aircraft carriers remain a centerpiece of the nation's maritime ability to support allies in need and to deter, fight and win major wars, and they are complemented by a full array of platforms that operate from the sea and shore to maintain our freedom.

It is important to recognize the long and distinguished legacy of aeromedical research that began when the Navy established its first aviation medical research unit at NAS Pensacola in 1939. By the 1950s, the Pensacola research unit, then a department under the School of Aviation Medicine, was the world's leading center for human acceleration research and played a prominent role in the success of the U.S. space program. In 1970, the aeromedical research function at Pensacola was designated the Naval Aerospace Medical Research Laboratory (NAMRL). NAMRL is in the midst of relocating to Wright-Patterson Air Force Base to become part of the Naval Medical Research Unit – Dayton (NAMRU-Dayton) and part of DoD's new Center of Excellence for Aeromedical Research, Education and Training.

NAMRU-Dayton combines scientific and technical expertise in the fields of aerospace medicine and toxicology research enabling Navy Medicine to provide expanded support for warfighter performance. The merger creates a premier military medical laboratory capable of addressing operationally relevant research areas in numerous warfighter domains.

Now we must look to the future. The U.S. is the world's technology leader; however, in recent years the number of graduates in science, technology, engineering and mathematics (STEM) education has not kept up with an increasing demand. This trend threatens America's future economic security and ability to provide advanced technologies that give warfighters the edge. It is very important for members of the NMRC enterprise to become involved with naval STEM initiatives to invest in our science and technology education processes so in the next 100 years we can again celebrate our accomplishments, innovations and teamwork.



Commanding Officer sends,  
Richard L. Haberberger, Jr.  
CAPT, MSC, USN

## Studying Hard in School Opens Doors, Stresses Astronaut

*By Lt. Jennifer Cragg, Submarine Group 2 Public Affairs Officer*

More than 1,100 students and teachers from 12 Connecticut high schools were treated May 26 to a once-in-a-lifetime opportunity at Robert E. Fitch High School to learn from a former submariner and veteran of three NASA space shuttle flights.

Capt. Stephen G. Bowen, NASA astronaut, a native of Cohasset, Mass., stressed the importance of education, particularly in science and math, which help to expand the number of career choices, especially in his own life, during the science, technology, engineering and math (STEM) event.

"A lesson learned for me was if you study hard in school and do well in a lot of classes, you have more choices," said Bowen. "There are

many other places I could have gone, but I chose to go to the U.S. Naval Academy. By the time I got out of the Naval Academy, I chose to go into submarine force."

Bowen graduated from Cohasset High School. He earned a degree in electrical engineering from the U.S. Naval Academy and a degree in ocean engineering from the Massachusetts Institute of Technology. In July 2000, he was selected to be a mission specialist for the Space Shuttle Program, becoming the first submarine officer selected by NASA.

"He is unique. He is the only submariner to be accepted for the astronaut career track," said retired Navy Cmdr. Tony Quatroche, a former New London Submarine Base and Submarine School executive officer, who currently teaches math at Robert E. Fitch High School.

Capt. Paul Kelleher, commanding officer, [Naval Submarine Medical Research Laboratory](#), along with Eastern Connecticut Workforce Investment Board and the EASTCONN Regional Educational Service Center, helped to arrange Bowen's visit. Also attending the STEM event was fellow U.S. Navy Academy classmate, Capt. William Merz, commanding officer, Commander Submarine Development Squadron 12.

Bowen reflected on working in the "world's greatest job" and his thoughts on being chosen for the astronaut program.

"You feel very lucky to be chosen," said Bowen. "Of those that apply and qualify, only about 0.8 percent gets selected," said Bowen.

During his visit, Bowen discussed both his career track in the submarine

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## NMRC Microbiologist Supports Preventive Medicine Mission in Kuwait

Lt. Michael Prouty was recently deployed to Kuwait as the lead microbiologist for the Forward Deployable Preventive Medicine Unit (FDPMU). At the Naval Medical Research Center (NMRC), Lt. Prouty works in the Infectious Diseases Directorate (IDD), Enteric Disease Department.

The primary mission of the FDPMU is to provide force health protection by rapidly assessing, controlling and preventing potential health threats in forward deployed areas. Acting in support of Expeditionary Medical Facility-Kuwait, the FDPMU is responsible for the preventive medicine/public health mission within the Area Support Group-Kuwait area of operation.

The FDPMU is a sixteen-member team comprising five components: preventive medicine, microbiology, chemical, disease vector and logistical/administrative support. Each component works in conjunction with the others to provide a complete threat assessment not readily available elsewhere in theater.

"In forward bases, personnel are in tight quarters and the potential for disease outbreak is high. Proper sanitation steps and rapid disease identification are paramount to minimize exposure and risks ensuring that our forces are healthy and ready to pursue their mission," Prouty said.

The hard work from current and past FDPMUs has significantly reduced time lost in theater due to disease and non-battle injuries (DNBIs) by quickly responding to medical health issues, ensuring heightened readiness of our deployed troops and allies. DNBIs have been a significant source of lost time in theater.

The FDPMU's goal is to identify and mitigate potential risks to our troops, enhancing overall military readiness.

"Historically, disease has incapacitated more of our troops than actual battlefield injuries. My job here is to minimize disease risks, ensuring that our force is healthy and ready to pursue their mission," Prouty added.



*Lt. Michael Prouty (right) provides guidance to SeaBees for mold abatement.*

The microbiology component of the FDPMU is equipped with state-of-the-art equipment allowing for the rapid identification of numerous biological samples. The high-tech equipment, combined with traditional microbiological methods, allows the microbiology component to function much as a stateside laboratory. Additional expertise can be provided by reach-back support to laboratories within the

continental United States.

The deployment has also provided Prouty with the opportunity to experience the full spectrum of Navy microbiology. "In research, we sometimes get so focused on our projects that we forget there is a much wider picture. This deployment has allowed me to see how Navy microbiology positively impacts our military on multiple levels," Prouty said.

## NAMRU-6 Expert Joins UN Panel to Investigate Cholera in Haiti

By Lt. Jeremy Westcott, NAMRU-6 Public Affairs



Dr. Claudio Lanata, Science Director from U.S. Naval Medical Research Unit No. 6 (NAMRU-6) in Peru, was one of four experts on the United Nations independent panel investigating the cause of cholera in Haiti.

In late October 2010, cholera appeared in Haiti for the first time in nearly a century. The outbreak has since claimed over 4,500 lives and sickened almost 300,000 people. The source of the cholera has been controversial, with several hypotheses arising regarding how the pathogen that causes cholera (*Vibrio cholerae*) arrived in Haiti.

One hypothesis, that soldiers from a cholera-endemic country deployed to provide aid in the wake of the Haitian

earthquake were the source of the cholera, is a commonly held belief in Haiti.

In response, the United Nations Secretary-General, Ban Ki-moon, directed the formation of an independent panel of four experts to "investigate and seek to determine the source of the 2010 cholera outbreak in Haiti." Lanata is one of the panel members.

Lanata's panel found the Haiti cholera outbreak was caused by the confluence of environmental contamination with feces; simultaneous water, sanitation and health care system deficiencies; combined with conducive environmental and epidemiological conditions.

It was not the fault of, or deliberate action of, a group or individual. The report made several recommendations intended to help prevent future introduction and spread of cholera. The full report is available on the United Nations website at [www.un.org/News/dh/infocus/haiti/UN-cholera-report-final.pdf](http://www.un.org/News/dh/infocus/haiti/UN-cholera-report-final.pdf).

Lanata joined the staff of NAMRU-6 in February 2011. He is also a Senior

Researcher at the Nutritional Research Institute in Lima, Peru, which he joined in 1983 after returning from his post-graduate training in the United States. In 1977, he obtained his M.D. from the Peruvian University Cayetano Heredia. He then went to the U.S. to do post-graduate training in internal medicine at St. Vincent's Medical Center in Bridgeport, Conn., which was followed by a fellowship on infectious diseases at the University of Maryland. In 1982, he became a Research Fellow in Geographical Medicine at the School of Medicine at Johns Hopkins University, and in 1983 he obtained a Master's Degree in Public Health from the School of Hygiene and Public Health at Johns Hopkins.

For many years, he has been an active collaborator with the World Health Organization and the Pan American Health Organization, where he has participated and continues to be part of several expert committees on diarrheal diseases and vaccine development.

## NSMRL Researcher Presents Human Hearing Study at ASA Conference

By Lt. j.g. Sonya Butler, NSMRL Public Affairs



Dr. Michael Qin, principal investigator from the Naval Submarine Medical Research Laboratory (NSMRL), Groton, Conn., presented current research on underwater hearing at the 161st Meeting of the Acoustical Society of America (ASA) May 23-27 in Seattle, Wash.

Human hearing is remarkable in its subtle ability to distinguish a wide range of sounds across a wide range of frequencies. Recent research suggests humans naturally tap into the body's skeletal structure to extend hearing well into the normally ultrasonic range. Experiments conducted by Qin and his colleagues at NSMRL systematically documented human divers can detect underwater sounds up to 100kHz, well above accepted normal hearing frequencies (approximately 20 Hz to 20 kHz).

"Although human bone-conducted hearing at ultra-high frequencies has been documented, as yet there is no agreement on the underlying mechanism or mechanisms that make it audible," said Qin.

NSMRL researchers investigated potential underlying mechanisms for this phenomenon. One theory is human beings don't hear the sound itself directly. Transmission-path distortion has been suggested as a possible explanation for ultra-high frequency hearing. According to the transmission-path theory, the various tissues sound passes through in the head modify the ultra-high frequencies down into the audible frequency range. An alternative theory is although not its normal response, the human auditory system is able to respond to ultra-high frequency sound via direct inner-hair-cell stimulation.

This work is intended to link underwater hearing with bone conduction hearing to determine whether they share the same underlying mechanism.

NSMRL Commanding Officer, Capt. Paul Kelleher, said, "This study is one of many intriguing projects led by Dr. Qin and highlights the unique breadth of research conducted at NSMRL - from basic science to Fleet applications."

NSMRL, established in World War II to conduct mission-critical studies in night vision, sonar sound discrimination and personnel selection, continues to serve the fleet by taking the lead in undersea human factors, sensory sciences and operational medicine. NSMRL is at the forefront of operational undersea research and development, as it has been for over 50 years. NSMRL is located in Groton, Conn., near the juncture of the Thames River and Long Island Sound. Arrangements for system validation are conveniently made through Submarine School New London; sea trials with research products are coordinated through the Submarine Base New London and the Naval Undersea Warfare Center in Newport, R.I.



## NAMRU-3 Staff Members Respond to Disease Outbreak in Yemen

By Darnell P. Gardner Jr.,  
NAMRU-3 Public Affairs Officer

Al Hudaydah, a city on the Red Sea in western Yemen and home to several hundred Eritrean refugees, recently sustained an outbreak of illness suspicious for dengue. A cluster of patients presented to local health officials with symptoms similar to dengue - fever, headache, muscle and joint pains and a characteristic measles-like rash - but the diagnosis was not certain.

***With outstanding logistical support from WHO-EMRO, our team and four Yemeni entomologists were able to travel from the capital of Sana'a to Al Hudaydah within 24 hours. We visited two outbreak hotspots in the Al Khokha and Al Muneera districts, spanning 160 kilometers.***

Officials from the Yemeni Ministry of Health (MOH) and World Health Organization - Eastern Mediterranean Regional Office (WHO-EMRO) contacted the U.S. Naval Medical Research Unit No.3 (NAMRU-3) to assist in determining the cause of the outbreak. The scientific team of entomologist Dr. Alia Zayed and virologists Dr. Emad Mohareb and Ms. Iman Medhat quickly mobilized.

"With outstanding logistical support from WHO-EMRO, our team and four Yemeni entomologists were able to travel from the capital of Sana'a to Al Hudaydah within 24 hours. We visited two outbreak hotspots in the Al Khokha and Al Muneera districts, spanning 160 kilometers," said Zayed.

While in Al Khokha, the team visited the Al Hudaydah Eritrean

refugee camp and collected mosquitoes to determine their infectivity. Approximately 70 female *Aedes aegypti* "daylight biters" were captured using aspiration techniques, knock-down spraying and species-specific mosquito traps. Zayed identified the mosquitoes and then shipped them to NAMRU-3.

Processing mosquitoes involved separating the head and thorax from the abdomen of each mosquito, placing the specimens in prepared vials and labeling the vials according to locality and date of capture. The vials were transferred via air transport back to NAMRU-3.

Once received, personnel from the Arbovirus and Hemorrhagic Fever Unit (a division within the Virology and Zoonotic Disease Research Program) utilized real-time polymerase chain reaction (RT-PCR) to determine whether the targeted virus was present in the mosquito populations of the visited sites. If the virus was detected in the head and thorax parts, the mosquito would be classified as infectious and capable of spreading disease.

"RT-PCR results of the mosquito samples confirmed the outbreak was not dengue fever, but rather chikungunya, a virus closely related to dengue, that causes severe joint pain, fever, and a red or purple-spotted rash," said Dr. Maria Morales, NAMRU-3 virologist.

With this knowledge, the Yemeni MOH was able to properly respond with accurate means of treatment



*Dr. Alia Zayed, fifth from left, and a Yemeni entomologist survey water supply areas at the refugee camp. They informed camp leaders that mosquitoes were using uncovered water supplies as breeding grounds which was the main cause for the spread of disease.*

and disease suppression.

Continued surveillance of the refugee camp uncovered the primary cause of the outbreak. Team members discovered exposed drinking water reservoirs adjacent to the health unit recovery area that created ideal mosquito breeding grounds. Mosquitoes within close proximity of infected patients were feeding on sick persons and then transmitting infected blood to other patients during later feeding sessions.

Recommendations were made to cover up exposed water supplies with screens or cloth to hinder the breeding of female mosquitoes.

Zayed concluded, "This trip forged new friendships with the Yemeni MOH."



## Lt. Alan A. Strawn Wins Navy CIP Competition at NMC Portsmouth

By Dr. Douglas Tadaki, Regenerative Medicine Department Head, NMRC

Lt. Alan A. Strawn won the annual Navy-wide CIP competition held at Naval Medical Center Portsmouth, May 12. Strawn represented the National Capital Region after winning the Robert A. Phillips Resident Research Award in a competition at the National Naval Medical Center (NNMC), March 24.

Strawn is a fourth year general surgery resident in the Integrated Department of General Surgery at NNMC and Walter Reed Army Medical Center and is spending his research year in the Department of Regenerative Medicine at the Naval Medical Research Center (NMRC), Silver Spring, Md. He is the fourth resident working with the NMRC Department of Regenerative Medicine to have won this prestigious award in the last five years and is the latest example of a collaboration between medical research laboratories and

medical treatment facilities to develop future surgical clinician/scientists.

Under the direct supervision of senior surgeon Cmdr. Forest R. Sheppard, Strawn and his colleagues developed and utilized a laboratory model of intra-abdominal non-compressible hemorrhage to investigate the acute coagulopathy of trauma, post-shock systemic inflammatory response and to assess the efficacy of infusible hemostatic agents, specifically, Platelet Derived Hemostatic Agents (PDHAs), for the treatment of life-threatening hemorrhage.

Strawn's winning presentation was entitled "Lyophilized Platelet Transfusion Does Not Constitute an Immunologic Second Hit in a Non-Human Primate Model of Hemorrhagic Shock." His research demonstrated prolonged storage of platelets via lyophilization, in contrast to prolonged liquid storage, resulted in a pro-inflammatory effect equivalent to that of saline infusion. This finding



*Lt. Alan A. Strawn shakes hands with Rear Adm. Alton Stocks, Commanding Officer of the Naval Medical Center Portsmouth at the Navy Wide Research Competition in Portsmouth.*

supports the development of more logistically feasible and safer platelet availability as well as the further development of PDHAs for potential clinical use.

## Risk Assessment Study of Tidewater Spotted Fever in Virginia

In a recent issue of *Emerging Infectious Diseases*, researchers from the Naval Medical Research Center (NMRC), Silver Spring, Md. and collaborators from Old Dominion University, Norfolk, Va. outlined the risk of tick-borne Tidewater spotted fever in individuals living or visiting southeastern Virginia. According to the researchers, more information regarding the ticks and the pathogen of this bacterial disease is needed to implement appropriate preventive medicine measures.

"Tidewater spotted fever due to infection with *Rickettsia parkeri* transmitted by *Amblyomma maculatum* (Gulf Coast ticks) can be considered an emerging infectious disease. In this study, we reported for the first time the presence of large populations of *A. maculatum* ticks in Virginia. We found that just over 43 percent of the ticks collected in the summer of 2010 carried *R. parkeri*," said Dr. Allen L. Richards, senior scientist

at NMRC. "*R. parkeri* is a member of the spotted fever group of rickettsiae that has recently been shown to cause infections in people. Currently, there is little known about the distribution of *R. parkeri* and the tick that spreads the disease in the United States."

From May through September 2010 the research team collected ticks from three locations in southeastern Virginia: the Great Dismal Swamp in Chesapeake; Back Bay National Wildlife Refuge; and along the Elizabeth River in Portsmouth. Testing by real-time polymerase chain reaction assays developed by Dr. Ju Jiang, research associate at NMRC, and sequencing indicated that a high per-



*Male and female adult Gulf Coast ticks. Photo by Marcee Toliver.*

centage of the ticks contained *R. parkeri* DNA.

According to the researchers, the discovery of *A. maculatum* ticks in widely dispersed locations indicates the ticks are now established in southeastern Virginia.



## NHRC Supports COSC Pre-Deployment Training for Navy's MCT-4

From NHRC Public Affairs

Mobile Care Teams (MCTs) are a centerpiece of the Navy's Combat and Operational Stress Control (COSC) program for combat-deployed sailors. Prior to deployment to Afghanistan, members of MCT-4 received training developed and provided by the Bureau of Medicine and Surgery (BUMED), the Naval Center for Combat and Operational Stress Control (NCCOSC), and the Naval Health Research Center (NHRC). A major part of the team's mission is to provide command leaders with a psychological snapshot of the unit.

"We focused on real-life scenarios and understanding their role in supporting the many challenges IAs [Individual Augmentees] face on deployment," said Patrick Nardulli, a curriculum developer for NCCOSC who is a retired Navy field hospital corpsman. "We also provided the team with practices that help build mental resilience to avoid stress injuries."

Most of the training related to practical tools the team could use to apply principles of Operational Stress Control in identifying behaviors that indicate a sailor may be reacting to stress. One of those tools is the Behavioral Health Needs Assessment Survey (BHNAS).

NHRC's Lt. Cmdr. Katie Shobe, who deployed as part of MCT-2, led



*Mobile Care Team 2 and Mobile Care Team 3 turn-over in Bagram, December 25, 2010. From left: Lt. Bryan Pyle, Lt. Rosa Grgurich, Lt. Cmdr. Katie Shobe, Capt. Joe Sarachene, HM1 Dorenda Smith, Lt. Cmdr. Walter Carr, HM1 Ray Wahl, and Lt. Cmdr. Patcho Santiago.*

the final two days of pre-deployment training. Other NHRC training team members included Jerry Larson, Stephanie Kewley, Robyn McRoy, and Susan Hilton. The NHRC training focused on the background of BHNAS; content areas like mental health outcomes, risk factors and protective factors; survey processing; data cleaning; and data analysis.

NHRC provides reach-back support for the MCTs, so this pre-

deployment training not only prepared the team members for their in-theater mission, but will maximize team cohesion between the MCT and NHRC's BHNAS team.

"MCT-4 benefited from the previous teams' [MCTs 1-3] experiences and the training received definitely sets us up for continued success in serving our deployed Sailors," said Capt. (sel) Alan Nordholm, MCT-4's officer in charge.

## NAMRU-2 Pacific Assists Hawaii in Combating Dengue Fever

(Continued from page 1)

Disease Control and Prevention in Atlanta. The samples have been collected from all over the island of Oahu.

To date, the NAMRU-2/NEPMU-6 staff have collected and identified 1,905 *Aedes albopictus* females (the vector for dengue virus in Hawaii) from three sites set up by the NEPMU-6 Entomology Department and one site set up by the state of Hawaii. The mosquitoes are being analyzed using a

prototype dipstick test for dengue virus that is being field tested and evaluated in conjunction with Walter Reed Army Institute of Research (WRAIR).

"We are very excited to be partnering with WRAIR in the beta test of this developmental dengue assay. This will make testing much more efficient, and if we can help get this test approved for use in the fleet, then great!" said Lt. Ian Sutherland, NEPMU-6 entomologist.

Mosquito samples have also been

tested by more conventional molecular biology techniques. NAMRU-2 Pacific microbiologist Lt. Dustin Harrison said, "It's a great opportunity for NAMRU-2 Pacific and NEPMU-6 to be supporting the state of Hawaii with this outbreak. It's a small island and that makes it easy for us to get engaged with our community. We're just happy to help."

As of yet, none of the mosquito or human samples have yielded positive results, which is good news for the residents of Oahu.

# Laser Eye Protection Advancements for the Navy's Future

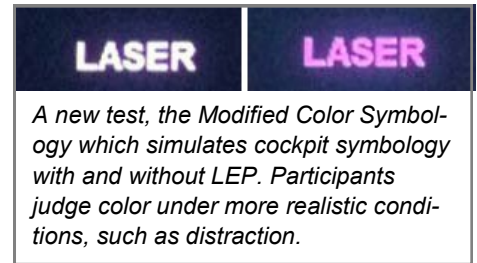
Provided by NAMRU-San Antonio  
Public Affairs

Increased laser power and reduced costs have led to widespread proliferation of lasers in civilian and military environments. Operational requirements now mandate the use of laser eye protection (LEP).

Military-grade LEP filters are complex and the altered perception produced by LEP filters often has significant impact on operational visual performance, mandat-

ing extensive testing to determine the effects of wearing an LEP design before it is fielded. LEP filters are required to go through standardized tests before being considered 'safe to fly' and fielded. Development costs for a single class of LEP can exceed 60 million dollars. There remains a need for improved prediction of visual compatibility so that LEP filter designs can be evaluated effectively before they enter the production phase.

What may be acceptable to a pilot in the lab may not be acceptable out in the fast-paced, high-stress environment in which LEP is used. While perceptual factors are challenging to study, they are not impossible. An In-house Laboratory Independent Research (ILIR) program grant from the Office of Naval Research awarded to Naval Medical Research Unit-San Antonio ([NAMRU-San Antonio](#)) provided the opportunity to examine the effect of LEP on color perception and develop tools for both pilots and LEP developers. A team of researchers led by Lt. Svec, a research psychologist, included computer engineer Dave Freeman of the Henry Jackson Foundation and vision scientist Tom Kuyk of the Air Force Research Laboratory (AFRL). The team is using novel methods to study human performance and new mathematical



A new test, the Modified Color Symbology which simulates cockpit symbology with and without LEP. Participants judge color under more realistic conditions, such as distraction.

models of color vision to generate predictions of visual performance and user acceptance.

The findings from this study will allow instrumental tools for the wearer to be developed as well as a metric of performance prediction. Wearers may benefit from training, while models with high predictive success will enable LEP developers to refine their prototypes during development, rather than after production.



Lt. Svec engages in the standard laboratory test, the Farnsworth Munsell 100 Hue test (FM-100) while wearing LEP.

## Networking in Washington for Future Collaborations with Industry Partners

Representatives of the [NMRC](#) Office of Legal and Technology Services ([OLTS](#)) attended the World Vaccine Congress 2011 in Washington D.C., held April 11-14 at the Gaylord National Hotel and Convention Center.

The event brought together a large group of stakeholders and showcased Federal and industry approaches to seven key vaccine markets. Key stakeholders in the vaccine market, such as the Food and Drug Administration (FDA), Sanofi Pasteur, Ligocyte Pharmaceuticals, Pfizer, Intercell and other business development executives, presented at the event.

"The presentations offered a unique perspective on the strategic goals of our potential commercialization

partners. Its Online Introductory Service also allowed us to arrange meetings with specific groups before, during and after the event," said OLTS's Roxanne Charles. According to Dr. Charles Schlagel, OLTS's Senior Licensing Specialist, "events like these give us an opportunity to highlight NMRC's research efforts and discuss the interests of potential partners."

As a result of the conference, the OLTS team has had multiple inquiries concerning partnering with NMRC. Through conference venues like these, companies can become aware of NMRC's extensive intellectual property portfolio for license.

"This communication is a significant step in our goal of vaccine commercialization," notes Charles.

The OLTS would like to say goodbye and thank you to Dr. Charles Schlagel, who is preparing for retirement next month. His service to NMRC as ORTA for the last 12 years has been exemplary. He has spearheaded major technology transfer initiatives that have grown the field in Department of Defense and Federal Technology Transfer circles. In addition to his many awards for promoting the field of Technology Transfer, we would like to recognize Dr. Schlagel for his dedicated service to NMRC's Technology Transfer program in support of our labs and medical facilities over the years.



## Flag Officers Visit Naval Medical Research Unit-San Antonio

By Randal K. LeBlanc, NAMRU-SA Public Affairs

During April and May, the Naval Medical Research Unit-San Antonio ([NAMRU-San Antonio](#)) hosted a number of Flag officers to the Battlefield Health and Trauma (BHT) Research Institute, Fort Sam Houston, the new home of NAMRU-San Antonio.

Rear Adm. Bruce Doll, medical advisor, NATO headquarters, Norfolk, visited BHT in late April. Before a tour of the facility, Capt. Vincent DeInnocentiis, NAMRU-San Antonio commanding officer, provided a command brief and summary of ongoing research efforts, including one of NAMRU-San Antonio's new projects, the test and evaluation of U.S. Marine Corps (USMC) tourniquets. This project is testing a series of tourniquets using the parameters agreed on at the March 2010 Department of Defense Tourniquet Summit. Researchers will evaluate the operational performance and expected performance in combat conditions and provide the Marine Corps Systems Command with a detailed analysis of the tourniquet performance data to aid in the selection of tourniquet, to be deployed in combat operations.

In May, Rear Adm. Forrest Faison III, commander, Navy Medicine West and Naval Medical Center San Diego, visited. DeInnocentiis provided a command brief and Cmdr. Ted St. John, NAMRU-San Antonio executive officer, directed a tour of the Navy's BHT spaces. In addition, Cmdr. Nora Perez of the combat casualty care department provided an overview of the USMC-sponsored project "Performance Testing and Evaluation

of Patient Active Warming Systems (PAWS)." The PAWS are evaluated in an environmental chamber at altitudes ranging from 500 feet to 10,000 feet and temperatures ranging from ambient 25°C down to -18°C. The result of this research will provide a metric for the PAWS performance on a non-biological load.

Later in May, Rear Adm. (sel) Raquel Bono, deputy director, Medical Resources, Plans, and Policy Division; Capt. Lee Cornforth, commanding officer, Navy Medicine Manpower Personnel Training and Education Command; Capt. Larry Garsha, commanding officer, Naval Operational Medicine Institute; Capt. Tom Sawyer, officer in charge, Naval Expeditionary Medical Training Institute; and Capt. Darin Rogers, assistant chief of staff, Navy Medical Support Command also

visited.

DeInnocentiis provided a walking and talking command brief and overviews of NAMRU-San Antonio ongoing research efforts. Dr. Nancy Millenbaugh, NAMRU-San Antonio dental research department, summarized her research effort entitled "Laser-Induced Opto-Acoustical Treatment of Microbial Infections." Millenbaugh's project will harness laser energy and photosensitizing dyes will be used to mediate the coupling of the incident laser energy to the microbial cell membranes.

In addition, the group toured the newly opened Tri-Service Research Laboratory (TSRL), which is located about two miles from the BHT. The TSRL is home of the Air Force and Navy Directed Energy Bioeffects facilities.



From left: Capt. Vincent DeInnocentiis, Rear Adm. Bruce Doll and Cmdr. R. Cestero tour NAMRU-SA.

## Studying Hard in School Opens Doors, Stresses Astronaut

(Continued from page 2)

force and the astronaut program, stressing the importance of the teamwork aspect of flying in space.

"STS-132 was the first mission in over a decade where every single crew member had flown in space previ-

ously," said Bowen. "Based on that, we chose to emphasize the team effort required while in space."

The Eastern Connecticut high schools participating included: Robert E. Fitch High School, Bacon Academy, East Lyme High School, Ellis Technical

High School, Ledyard High School, Lyme-Old Lyme High School, Norwich Free Academy, Old Saybrook High School, Stonington High School, Windham High School, Woodstock Academy, and Valley Regional High School.

## Naval Health Research Center's Tactical Medical Logistics Planning Tool

(Continued from page 1)

oped an integrated, clinically based medical requirements planning platform called the Tactical Medical Logistics Planning Tool (TML+), which incorporates materiel data linked to clinical workload forecasts and clinical practice guidelines.

TML+ is a tool that models patient flow from the point of injury through more definitive care and an analysis tool that supports operational risk assessment, field medical services planning and systems analysis. TML+ includes significant underlying data, containing over 400 injury and illness conditions expressed as International Classification of Diseases, 9th Revision diagnostic codes, medical treatment tasks for the diagnoses, the

medical personnel required, treatment times and consumable supplies and equipment to execute each task. NHRC generated these underlying information sets over many years by studying and gathering empirical and historical data.

TML+ can optimize a mission's goals, maximize results and organize the implementation. It can be used to establish whether a particular medical treatment facility can successfully handle a specific patient stream and demonstrate how changing the distance among treatment facilities with different capabilities affects patient treatment. It can show the personnel, supply and transportation assets used by the expected patient stream. TML+ has the capability to model an operat-

ing room, intensive care unit, emergency room, triage, lab, x-ray, and ward functionality to analyze the efficacy of a medical treatment facility down to the functional level.

Military medical planners now have TML+ to help determine the minimum medical capabilities necessary to maximize medical outcomes and success of the expeditionary medical mission. It has reduced costs, morbidity and mortality through strategic advanced planning and assessment of multiple "what if" scenarios.

TML+ provides the analyst with the capability to model the entire time phased employment of medical facilities and the associated transportation network, personnel and supplies—all synchronized with the operational plan.

### Greetings from the NMRC Ombudsman!

**Military Moving:** We all know how it is with the military: moving becomes a common occurrence in your life and that of your family. When Permanent Change of Station (PCS) orders are presented, families must move from one duty station to another. The best way to make a military move easier is to be prepared. The move can become stressful when a family feels unorganized. There are many things you can do to lighten the load. If you establish a timeline of what needs to be done and when you need to do it, you can greatly improve the moving process. Check out Fleet and Family Support Center's [Relocation Assistance Program](#) and get all the information you need to have a successful move.

**Looking for Summer Fun?** [Blue Star Museums](#) is back for a second year. The National Endowment for the Arts and more than 1,000 museums in all 50 states will offer free admission to active-duty military personnel and their families from Memorial Day, May 30 through Labor Day, September 5.

The Anheuser Busch "[Here's to the Heroes](#)" program will provide members of the military and as many as three direct dependents with a free single-day complimentary admission to SeaWorld Orlando, San Diego or San Antonio; Busch Gardens Tampa Bay or Williamsburg; Sesame Place; Water Country USA; and Adventure Island.

**Career Readiness for Spouses: Moving? Are You Ready to Hit the Ground Running?** Ever heard the terms "Career or Job Readiness?" Maybe not. But they are important concepts that will help you do some preparation and decision making *before* you hit the pavement (or Internet) to look for a job at your next duty station.

**SECO to the Rescue** – DoD's new Spouse Education and Career Opportunities – SECO – program has career readiness information and support services online and by phone. You can reach the Spouse Career Center through the [Military OneSource](#) website and the call center at 800-342-9647. The program also offers the [MyCAA](#) program, which provides financial assistance to spouses in junior military pay grades who are just getting started on a program of study leading to a license, credential or Associates degree. Additionally, SECO has recently expanded a Military Spouse Employment Partnership program to link Army, Navy, Marine Corps and Air Force spouses who are "career ready" to military-friendly employers who are *ready* to hire them. So, take some time now to improve *your career and job readiness!*

If you need more information on these or any other resources, please contact me at [angela.prouty@med.navy.mil](mailto:angela.prouty@med.navy.mil) or 217-722-4981.

Angela Prouty  
Ombudsman, NMRC



## From One Hour to One Lifetime – Increasing STEM Initiatives the Easy Way

By Lt. Svec, STEM Volunteer, NAMRU  
-San Antonio

In Navy Rhumb Lines April 26, Chief of Naval Research Rear Adm. Nevin Carr said, "Our overarching STEM objective is simple. Increase, inspire and support the talent pool from which the future's great Sailors, naval scientists and engineers will come."

The acronym STEM stands for Science, Technology, Engineering and Mathematics. The goals of naval STEM initiatives are to increase hands-on learning opportunities, mentor, increase outreach to K-12, and increase advanced research opportunities.

Most people may think the time commitment required for STEM projects seems too much. But it is easy to commit just one day. Expanding Your

Horizons is an organization that brings local women in STEM careers to lead workshops for young girls. A one-day event served over 600 students who wished to learn more about STEM fields. During workshops like this, facilitators volunteer to share their knowledge and engage the girls in activities. Other one-day activities include science fair judging and career day at a local elementary school. In these types of activities you get to share your knowledge with students and inspire them to pursue STEM careers.

One of the most straightforward ways to increase STEM activities is to partner with an organization that already exists. The international organization Girls, Inc., for example, works toward inspiring girls to be strong, smart and bold through programs that enable life skills and academic opportunities. Opportunities range from mentoring a single student, speaking at summer science camps, or working on specific projects over time, such as curriculum development.

Working STEM initiatives can include partnering with a local university. Whether you are an adjunct professor reaching many students, offering independent study to just one student or bringing several students into your lab to do guided projects, your presence makes a difference. Allowing students to pursue their interests while slowly introducing scientific methods and math is an easy way for them to learn the joy of science, as University of



From left: UTSA student Pandora Paisley, Lt. Svec, and UTSA student Taryn Garcia. Photo by Monica McCoy, NAMRU-SA Command Ombudsman.

Texas, San Antonio (UTSA) student, Megan Bray did.

Another UTSA project by students focused on bringing health initiatives into the workplace. Students "planted happiness" by bringing plants to the workplace and measuring pre/post wellness ratings. Survey participants completed a form and received a free plant. It may not be cutting edge research, but to these students it is the most exciting project in the world and they feel a sense of ownership and ability.

Whether you spend one hour at a career day, one day with a local organization, or develop a mentorship that last a lifetime, it is a significant and much needed investment in the future of Naval STEM.



UTSA student Megan Bray presenting her research at the UTSA Spring Research Conference, 2011. Photo by Lt. Svec.

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